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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/493,091	01/28/2000	Patrick Brindel	Q57709	1773

7590

07/28/2004

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EXAMINER
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LI, SHI K

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 07/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/493,091

**Applicant(s)**

BRINDEL ET AL.

**Examiner**

Shi K. Li

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2004.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 4-5, 8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki (U.S. Patent 5,524,144).

Regarding claim 1, Suzuki teaches in FIG. 5 a WDM transmission system comprising a transmitter 1 for transmitting a set of wavelength channels, a receiver 2 and a set of repeaters 3.

Suzuki teaches in FIG. 9 and col. 12, lines 25-34 that a repeater only repeats a subset of the wavelength channels.

Regarding claim 4, Suzuki teaches in FIG. 9 to use an optical amplifier for regenerating the signal.

Regarding claim 5, Suzuki teaches in FIG. 9 to regenerate  $\lambda_3$ - $\lambda_8$  in the first regenerator.

Regarding claim 8, Suzuki teaches in FIG. 9 demultiplexer 54 and multiplexer 55.

Regarding claim 10, the channel regenerator of Suzuki comprises an amplifier.

***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent 5,524,144) in view of ITU G.692 (ITU-T G.692, "Optical Interfaces for Multichannel Systems with Optical Amplifiers", October 1998, pp. 1, 4-5).

Suzuki has been discussed above in regard to claims 1, 4-5, 8 and 10. Regarding claim 2, the difference between Suzuki and the claimed invention is that Suzuki does not teach that the number of channel repeater is a submultiple of the number of channels. However, it is well known in the art that the number of channels depends on the applications and the number of repeaters depends on the distance between the source and the destination. For example, ITU G.692 lists in Table 2 a 16-channel system with 3 spans. The number of repeater is one less than the number of spans. That is, the number of repeater is a submultiple of the number of channels. One of ordinary skill in the art would have been motivated to combine the teaching of ITU G.692 with the transmission system of Suzuki because following international standards promotes interoperability. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to deploy transmission system with 16 channels and 2 regenerators, as taught by ITU G.692, based on the transmission system of Suzuki because following international standards promotes interoperability.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent 5,524,144).

Suzuki has been discussed above in regard to claims 1, 4-5, 8 and 10. The difference between Suzuki and the claimed invention is that Suzuki does not teach that each group includes only one channel. However, it is well known in the art that the number of channels in a group depends on the application. For example, in a transmission system comprising a transmitting

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site, a receiving site and two repeaters A and B, the transmitting site can generate two wavelengths, repeater A drops and adds one wavelength and amplifies one wavelength, repeater B drops and adds one wavelength and amplifies one wavelength. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to regenerate one wavelength at each repeater in the WDM transmission system of Suzuki when the application only requires one pass-through wavelength in each repeater.

6. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent 5,524,144) in view of Knox et al. (U.S. Patent 5,822,106).

Suzuki has been discussed above in regard to claims 1, 4-5, 8 and 10. Suzuki includes in FIG. 9 optical sender 51 in the repeater. Inherently, optical sender 51 includes modulator for combining data with carrier. The difference between Suzuki and the claimed invention is that Suzuki does not teach to use a synchronous modulator. Knox et al. teaches in col. 1, lines 12-14 that it is desirable to have signals of different channels to be synchronized so that a common clock signal can be used. One of ordinary skill in the art would have been motivated to combine the teaching of Knox et al. with the WDM transmission system of Suzuki et al. to use a synchronous modulator for the optical sender because this enables a common clock signal to be used for all channels. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use synchronous modulator for the optical sender, as taught by Knox et al., in the WDM transmission system of Suzuki et al. because this enables a common clock signal to be used for all channels.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent 5,524,144) in view of Bo et al. (W. Bo et al., "Fiber Gratings Based Optical Add/Drop

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Multiplexer with Low Interferometric Crosstalk", International Conference on Communication Technology, ICCT'98, October 22-24, 1998).

Suzuki has been discussed above in regard to claims 1, 4-5, 8 and 10. The difference between Suzuki and the claimed invention is that Suzuki uses a multiplexer/demultiplexer to separate the channel and recombine the channels while the claimed invention uses inserter/extractor for isolating channels. Bo et al. teaches in FIG. 2 an OADM which can be used to extract/insert one or more specific channel from a WDM system. This OADM is ideal for extracting a small number of channels and has low insertion loss and good isolation. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an inserter/extractor to isolate the channels and recombine the channels, as taught by Bo et al., in the transmission system of Suzuki because an inserter/extractor has low insertion loss and good isolation.

8. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent 5,524,144) in view of Kinoshita (U.S. Patent 6,023,366).

Suzuki has been discussed above in regard to claims 1, 4-5, 8 and 10. Regarding claim 11, the difference between Suzuki and the claimed invention is that Suzuki does not teach supervisory channel. Kinoshita teaches in FIG. 1 to use a dedicated channel  $\lambda_{SV}$  for supervisory purpose. One of ordinary skill in the art would have been motivated to combine the teaching of Kinoshita with the transmission system of Suzuki because a supervisory channel can be used to convey information about channels for the payload and monitor the status of amplifiers and repeaters. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a dedicated channel for supervisory purpose, as taught by

Kinoshita, in the transmission system of Suzuki because a supervisory channel can be used to convey information about channels for the payload and monitor the status of amplifiers and repeaters.

Regarding claim 12, Kinoshita teaches in FIG. 1 means 24 for separating the dedicated channel.

Regarding claim 13, Kinoshita teaches in FIG. 2 the delivery of optical output signal to the supervisory unit.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent 5,524,144) in view of Chraplyvy et al. (U.S. Patent 5,847,862).

Suzuki has been discussed above in regard to claims 1, 4-5, 8 and 10. The difference between Suzuki and the claimed invention is that Suzuki does not teach the arrangement of amplifiers and regenerators such that the spacing of optical regenerators is a multiple of the spacing of the optical amplifiers. Chraplyvy et al. teaches in FIG. 1 the position of a plurality of amplifiers between regenerators because fiber causes attenuation but introduces very little noise and, therefore, amplification of signal is required more often than regeneration of signal. One of ordinary skill in the art would have been motivated to combine the teaching of Chraplyvy et al. with the transmission system of Suzuki because the arrangement of Chraplyvy et al. minimize the placement of expensive regenerators. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to position multiple amplifiers between regenerators, as taught by Chraplyvy et al., in the transmission system of Suzuki.

***Response to Arguments***

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10. Applicant's arguments with respect to claims 3-4 and 10-13 have been considered but are moot in view of the new ground(s) of rejection.

11. Applicant's arguments with respect to claims 1-2, 5, 8-9 and 14 have been fully considered but they are not persuasive.

Applicant argues that Suzuki amplifies all wavelengths that are not branched out through an optical receiver 52 or through an optical sender 51. However, Suzuki only amplifies a predetermined group of channels, e.g., channels  $\lambda 3$ - $\lambda 8$ , which is a subset of  $\lambda 1$ - $\lambda 8$ . That is, the group of channels that are amplified is a subset of a set of channels. This reads on the claim limitation "each respective group forming only a subset of a set of channels".

Applicant argues that Suzuki just teaches a repeater for certain wavelengths but not a regenerator, which reshapes the signal. In response, the Examiner provides the following evidence. Applicant admits in page 2, lines 12-13 of the specification that "3R" regenerators "reshaping", "retiming and "reamplifying" the signal. A regenerator can be 1R, 2R or 3R. Anslow et al. (U.S. Patent 6,433,899 B1) teaches in col. 2, lines 38-41 that 1R regenerator regenerates the signal, 2R regenerator regenerates and reshapes the signal and 3R regenerator regenerates, reshapes and retimes the signal. According to the admission and Anslow et al., Suzuki teaches in FIG. 9 to regenerate  $\lambda 3$ - $\lambda 8$  using amplifier 53 and node 5 of FIG. 9 is a regenerator.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER